



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,288	07/14/2003	Mahadeva P. Sinha	06618-914001/CIT-3721	7721
20985	7590	06/15/2006	EXAMINER	
FISH & RICHARDSON, PC			ROY, SIKHA	
P.O. BOX 1022			ART UNIT	PAPER NUMBER
MINNEAPOLIS, MN 55440-1022			2879	

DATE MAILED: 06/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

37

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/620,288	SINHA, MAHADEVA P.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Sikha Roy	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 March 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-4,9,11-13,21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-4,9,11-13,21 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

The Amendment, filed on March 24, 2006 has been entered and acknowledged by the Examiner.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2,3,9,11,21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 2,993,638 to Hall et al., U.S. Patent 3,949,260 to Bayless et al. and further in view of U.S. Patent 3,460,745 to Lamont.

Regarding claim 21 Hall discloses (Figs. 15 column 9 lines 3-5, column 10 lines 51 through column 11 line 37) an ion pump comprising plurality of anodes 18 which are substantially cylindrical and having first and second open ends, a combined housing and cathode structure 25 (cathode comprising plurality of cathode plates lining the rectangular vacuum envelope) formed of cathode material, forming vacuum tight seal and having a hollow conduit 2 for connection to the vessel to be evacuated, the housing and cathode structure forming plurality of surrounding surfaces that surround the anodes 18 on all sides of the anodes and having plurality of extending surfaces (cathode rods)73 extending into the vacuum tight sealed area and into insides of the anodes from cathode surfaces 25, a magnet 27 surrounding at least a portion of the

Art Unit: 2879

cathode and housing structure and a connection (conductive rod) 19 for voltage source which allows pumping by the ion pump.

Hall does not expressly disclose the cathode material including a connection for a vessel forming a vacuum tight seal.

Bayless in relevant art of low pressure gas discharge device discloses (Fig. 1 column 2 lines 16-38) a low pressure gas discharge device which can act as ion pump comprising housing and cathode 12 formed of cathode material connected to foot 18 for forming vacuum seal. Bayless notes (column 1 lines 45-58) this configuration provides an economic, reliable and safe device of long life. Further it is noted that this configuration having the housing and cathode formed of the same material forming vacuum tight seal eliminates forming separate housing, thus resulting in easy manufacturing and cost reduction.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the housing and the cathode of Hall formed of the same material forming a vacuum tight seal as taught by Bayless for providing an economic reliable ion pump formed by easy manufacturing and reduced cost.

Hall does not exemplify the cathode structures having extending surfaces into insides of the anodes from both first and second open ends.

Lamont in same field of endeavor discloses (Fig. 3 column 3 lines 1-15) cathode plates comprising projections 6 such as cylindrical posts extending towards the anode 4 from both the open ends of the anode. Lamont further teaches (column 2 lines 24-43)

this configuration provides sputtering taking place from both ends and sides of the post whereby the pumping speed is increased.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the plurality of cathode structures of Hall and Bayless et al. extend from both the first and second open ends of the anode as taught by Lamont for increasing the pumping speed of the pump.

Referring to claim 2 Hall discloses (column 5 lines 23-35) the housing and cathode structure 25 formed of titanium.

Regarding claim 3 Hall discloses (column 5 lines 60-66) the magnet 27 is formed of substantially C (horse-shoe) shape.

Regarding claim 9 Hall discloses (Fig. 1 column 10 lines 67-70) the pump further comprises a source of DC positive potential applied to the anode 18 and the cathode plates 25 coupled to the rectangular housing are connected to ground potential.

Regarding claim 11 it is clearly evident from Fig. 15 that the magnetic field provided by magnet 27 extends along a direction that is co-axial with the axis of the anodes 18.

Regarding claim 22 Hall discloses (column 10 lines 55-61) both the housing (lining of the envelope) 25 and the plurality of extending surfaces 73 are both made of cathode material, titanium.

Art Unit: 2879

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 2,993,638 to Hall et al., U.S. Patent 3,949,260 to Bayless et al., U.S. Patent 3,460,745 to Lamont and further in view of U.S. Patent 5,689,070 to Clark et al.

Regarding claim 4 Hall, Bayless and Lamont do not exemplify the magnet formed of one of vanadium permendur magnetic material.

Clark in pertinent art of electromagnetic acoustic transducer discloses (column 5 lines 19-30) the core formed of magnetic material such as vanadium permendur. Clark further notes that this configuration of the core made of vanadium permendur has high magnetic permeability and high saturation magnetization and hence provides strong magnetic saturation field.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the permanent magnet in the ion pump of Hall, Bayless and Lamont made of vanadium permendur as taught by Clark for providing strong magnetic field resulting in excellent operation of the ion pump.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 2,993,638 to Hall et al., U.S. Patent 3,949,260 to Bayless et al., U.S. Patent 3,460,745 to Lamont and further in view of U.S. Patent 5,525,799 to Andresen et al.

Regarding claim 12 Hall and Lamont are silent about a GCMS system receiving its vacuum from the ion pump.

Andresen in relevant art discloses a GCMS system having an ion pump attached, for removing trace of gas impurities.

Art Unit: 2879

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include a GCMS system attached with the ion pump of Hall, Bayless and Lamont as suggested by Andresen for removing trace of gas impurities from the GCMS system.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 2,993,638 to Hall et al., U.S. Patent 3,949,260 to Bayless et al., U.S. Patent 3,460,745 to Lamont and further in view of U.S. Patent 6,805,980 to Uehara.

Regarding claim 13 Hall discloses a permanent magnet providing the magnetic field. Hall does not explicitly disclose the magnet formed of high energy product value magnet.

Uehara in pertinent art of thin film magnet production discloses (column 1 lines 15-25) thin film permanent magnets formed of Nd-Fe-B based magnetic material and Sm-Co based magnetic material yield high magnetic energy product and therefore can be used in a miniaturized electrical apparatuses.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to substitute thin film high magnetic energy product value magnet as taught by Uehara for the permanent magnet in the ion pump of Hall, Bayless and Lamont for providing high magnetic energy and enhanced performance with reduced weight of the ion pump.

### ***Response to Arguments***

Applicant's arguments with respect to claim 21 have been considered but are moot in view of the new ground(s) of rejection.

In response to applicant's argument (Remarks page 6, paragraph 2) that there is no suggestion to combine the references of Hall and Lamont, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Lamont teaches (column 2 lines 24-43) this configuration of plurality of cathode structures extending from both ends into the anodes provides sputtering taking place from both ends and sides of the post whereby the pumping speed is increased. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the plurality of cathode structures of Hall and Bayless et al. extend from both the first and second open ends of the anode as taught by Lamont for increasing the pumping speed of the pump.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 4,091,310 to Harvey and JP 07312202 to Komiya



Art Unit: 2879

disclose a cathode forming the outer physical structure and acting as the vacuum envelope.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

#### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikha Roy whose telephone number is (571) 272-2463. The examiner can normally be reached on Monday-Friday 8:00 a.m. – 4:30 p.m.

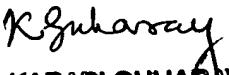
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization is (571) 273-8300.

Art Unit: 2879

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S.R.

Sikha Roy  
Patent Examiner  
Art Unit 2879

  
**KARABI GUHARAY**  
**PRIMARY EXAMINER**